

## 560.5 Payment

### A. Backfill

Backfill will be paid for according to Section 207.

### B. Structural Plate Pipe, Pipe-Arch, and Arch Culvert

Structural plate pipe and pipe-arch installations, complete in place and accepted, will be paid for at the Contract Price per linear foot (meter). Arch culvert installations, complete in place and accepted, will be paid for per Lump Sum. This payment will be full compensation for the Item, including:

- Excavating
- Furnishing and hauling materials
- Installing
- Cutting pipe where necessary
- Repairing or replacing damaged sections
- Making connections, strutting and elongating
- Providing temporary drainage
- Joining an extension to an existing structure, where required

Payment will also be full compensation for removing, disposing, or using excavated materials as directed by the Engineer.

Payment will be made under:

Item No. 560	Structural plate pipe ____ in (mm) H= ____	Per linear foot (meter)
Item No. 560	Structural plate pipe-arch ( <u>span</u> ) in (mm), ( <u>rise</u> ) in (mm)	Per linear foot (meter)
Item No. 560	Structural plate arch culvert, structure no. ____	Per lump sum

### 560.5.01 Adjustments

Excavation will not be paid for separately, but all of the other provisions of Section 205 and Section 208 shall govern.

## **Section 561—Renovating Existing Pipe**

### 561.1 General Description

This work includes furnishing and inserting helically corrugated metal pipe, smooth-lined corrugated polyethylene pipe, high density polyethylene profile wall pipe, and high density polyethylene solid wall pipe or a polyvinyl chloride pipe inside an existing metal pipe and pressure grouting the space between the two pipes.

#### 561.1.01 Definitions

General Provisions 101 through 150.

#### 561.1.02 Related References

##### A. Standard Specifications

Section 801—Fine Aggregate

Section 830—Portland Cement

Section 831—Admixtures

Section 844—Steel Pipe

Section 845—Smooth Lined Corrugated Polyethylene (PE) Culvert Pipe

Section 880—Water

Section 882—Lime

Section 883—Mineral Filler

**B. Referenced Documents**

GDT 84

**561.1.03 Submittals**

General Provisions 101 through 150.

**561.2 Materials**

Ensure that materials meet the requirements of the following Specifications:

<b>Material</b>	<b>Section</b>
Corrugated Steel Pipe (Helically Corrugated)	844.2.01*
Smooth-Lined Corrugated Polyethylene (PE) Culvert Pipe	845
Portland Cement, Types I or II	830
Mineral Filler (Limestone Dust)	883
Fly Ash, Type A	831
Water	880
Fine Aggregate, Size No. 20	801.2.02
Agricultural Lime	882.2.02**
*Use Georgia Standard 1030D to determine the metal thickness of the insert pipe.	
**For this Work, use agricultural lime that has 90 percent minimum passing the No. 30 (600 µm) sieve and 30 percent minimum passing the No. 200 (75 µm) sieve.	

**A. High Density Polyethylene (HDPE) Profile Wall Pipe**

Use pipe liner that consists of a HDPE profile wall pipe that conforms to the requirements of ASTM F 894. HDPE profile wall pipe shall have a minimum pipe stiffness of 46 psi (317 kPa) when tested according to ASTM D 2412. Polyethylene material shall have polyethylene pipe liners material designation of PE 3408 and shall have a material classification per ASTM F 1248 of Type III C5 P34 with a cell classification per ASTM D 3350 of 345434C.

Join HDPE profile wall pipe liner by butt or heat fusion method according to ASTM D 2657, or provide a positive mechanical joint. The joint shall be able to be pulled or pushed into the host pipe without joint separation.

**B. High Density Polyethylene (HDPE) Solid Wall Pipe**

Pipe liner shall consist of a HDPE solid wall pipe that conforms to the requirements of ASTM F 714 with an SDR of 21. Polyethylene material shall have polyethylene pipe liners material designation of PE 3408 and shall have a material classification per ASTM F 1248 of Type III C5 P34 with a cell classification per ASTM D 3350 of 345434C.

Join HDPE solid wall pipe liner by butt or heat fusion method according to ASTM D 2657, or provide a positive mechanical joint. The joint shall be able to be pulled or pushed into the host pipe without joint separation.

**C. Polyvinyl Chloride (PVC) Pipe**

Pipe liner shall consist of PVC corrugated pipe with a smooth interior that conforms to the requirements of ASTM F 949. PVC pipe shall have a minimum pipe stiffness of 46 psi (317 kPa) when tested according to ASTM D 2412. Use pipe made of PVC compound with a cell classification per ASTM D 1784 of 1245B.

Join the PVC pipe liner with a PVC coupling that uses elastomeric sealing gaskets. The assembled joint shall meet the performance requirements of ASTM D 3212. The joint shall be able to be pulled or pushed into the host pipe without joint separation. Ensure that elastomeric seals meet the requirements of ASTM F 477.

**D. Grout Mixtures**

Mix water with the dry ingredients to produce a grout with an efflux time from the flow cone of at least 16 seconds and no more than 22 seconds when tested according to GDT 84.

Add cement, cement and limestone dust, or cement and fine aggregate to the batch proportions to produce the required consistency.

Table of Grout Mixtures					
Mix Proportions, Percent by Weight of Dry Materials					
Dry Materials	Grout Types				
	1	2	3	4	5
Cement	25	25	25	25	100
Limestone dust		25	75	50	
Fly ash	25			25	
Fine aggregate	50	50			

### 561.2.01 Delivery, Storage, and Handling

Add cement, cement and limestone dust, or cement and fine aggregate to the batch proportions to produce the required consistency.

### 561.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

## 561.3 Construction Requirements

### 561.3.01 Personnel

General Provisions 101 through 150.

### 561.3.02 Equipment

#### A. Batching

Use weight hoppers and scales for each dry material or calibrated volumetric batch hopper. Calibrate volumetric batch hoppers in increments equivalent to one 94 lb (42.6 kg) bag of cement.

#### B. Mixing

Use a watertight batch-type mixer capable of blending the various materials into a homogenous mixture.

#### C. Grout Pumping

Use a positive-displacement, piston-type pump or a screw-type worm pump equipped with the following:

- Discharge line with a positive cut-off valve at the nozzle end and a by-pass return line to recirculate the grout back into a holding tank or mixer
- A nozzle or device at the end of the discharge line that will remain secure in the 1 in (25 mm) grout pipe and free of leaks

#### D. Pulling

Provide equipment capable of pulling the new helically corrugated metal pipe.

### 561.3.03 Preparation

General Provisions 101 through 150.

### 561.3.04 Fabrication

General Provisions 101 through 150.

### 561.3.05 Construction

#### A. Grout Mixtures

Use the Table of Grout Mixtures in Subsection 561.2.D, “Grout Mixtures.”

#### B. Installation

Install pipe liner according to the manufacturer’s guidelines and as specified in the plans, with the following requirements:

1. Clean and inspect the existing pipe before pulling or pushing the new pipe through.

2. Use a nose cone on all on all pipe liners. The nose cone shall have enough strength to withstand pulling or pushing of the new pipe liner. Weld or bolt the nose cone to the end of the liner. Use a nose cone that includes a ring for attaching the pulling cable.
3. After pulling or pushing the new pipe through the old one, plug the space between the pipes at both ends with concrete or mortar. Insert a 1 in (25 mm) grout pipe with threaded ends on the outside into the tops of the plugs at both ends of the pipes, and screw on a threaded cap.
4. After the pipe plugs have been in place long enough to develop strength to withstand pressure grouting, remove the grout pipe caps. Connect the grout pump to the downstream grout pipe and pump grout into the void until it flows freely from the upstream grout pipe.
5. After pumping is complete, replace the grout pipe caps.

**561.3.06 Quality Acceptance**

General Provisions 101 through 150.

**561.3.07 Contractor Warranty and Maintenance**

General Provisions 101 through 150.

**561.4 Measurement**

Renovating existing pipe is measured by the linear foot (meter) of the specified diameter of new pipe installed.

**561.4.01 Limits**

General Provisions 101 through 150.

**561.5 Payment**

Renovating existing pipe will be paid for at the Contract Unit Price bid per each diameter and metal thickness of new pipe. This payment will be full compensation for completing all work described in this Section, including cleaning and restoring damaged areas.

Payment will be made under:

Item No. 561	Renovating existing pipe_____ in (mm) diameter	Per linear foot (meter)
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**561.5.01 Adjustments**

General Provisions 101 through 150.

**Section 570—Minor Drainage Structures for Detours**

**570.1 General Description**

This work includes selecting, constructing, and maintaining minor structures used on detours for cross drains or side drains. Remove these structures when the detour is no longer needed.

This Item covers only the use of minor structures. When the Plans call for constructing, maintaining, and removing a detour bridge, apply Section 541.

**570.1.01 Definitions**

General Provisions 101 through 150.

**570.1.02 Related References**

**A. Standard Specifications**

Section 541—Detour Bridges

**B. Referenced Documents**

AASHTO HS-15

**570.1.03 Submittals**

If using a bridge-type structure instead of one or more pipes, present plans of the proposed structure to the Engineer for approval before beginning construction.